

SIEMENS
Ingenuity for life

Simcenter on the Rescale cloud platform

Gain immediate, on-demand access to high performance computing for simulation

Benefits

- Bring products to market sooner by scaling up modeling and simulation usage
- Increase innovation and product quality with more thorough design studies
- Optimize the mix between capital cost and operational expense for HPC and workstation needs
- Achieve faster time-to-value with rapid deployment using minimal effort

Summary

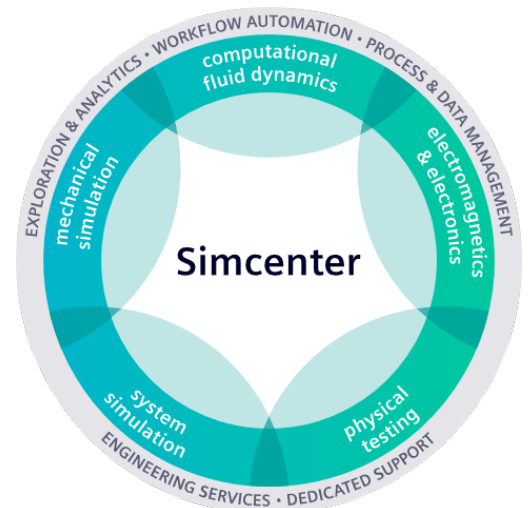
Engineers continuously need to speed up their product development and validation processes, and simulation is an excellent way to glean product performance knowledge earlier in the development cycle. However, the cost of computing infrastructure can sometimes be prohibitive, particularly for smaller businesses.

To help you overcome this challenge, Siemens Digital Industries Software has partnered with Rescale, a company

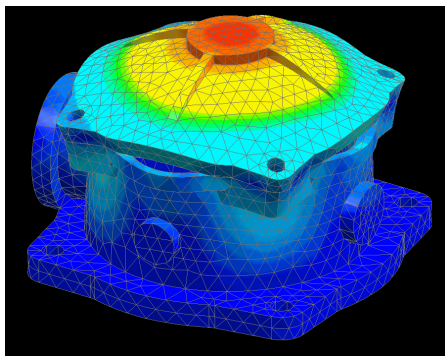
that provides a leading cloud engineering simulation platform, to offer Simcenter™ software customers with immediate, on-demand access to high-performance computing (HPC) resources.

Simcenter on the Rescale platform

Simcenter software is available on the Rescale platform, and Simcenter customers can use their existing licenses to run these Simcenter solutions on Rescale:



Simcenter on the Rescale cloud platform



Perform the entire structural simulation process – mesh, solve and postprocess – all on the cloud with Simcenter 3D

Mechanical simulation:

- Simcenter 3D
- Simcenter Nastran

Computational fluid dynamics:

- Simcenter STAR-CCM+
- Simcenter FLOEFD
- Simcenter Flotherm

Electromagnetic simulation:

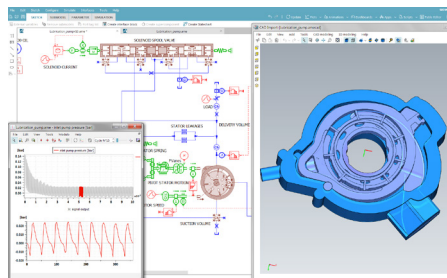
- Simcenter MAGNET
- Simcenter Motorsolve

System simulation:

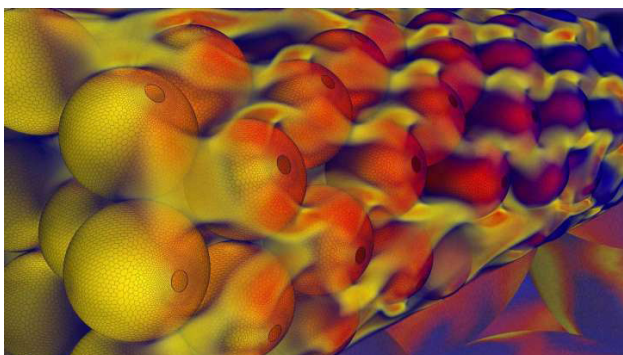
- Simcenter Amesim
- Simcenter Flomaster

Design space exploration:

- HEEDS



Predict the behavior of mechatronic systems from early design stages using Simcenter Amesim



Conjugate heat transfer simulation of a pebble-bed nuclear reactor using Simcenter STAR-CCM+

Rescale was founded in 2011 and has grown rapidly to become a leading cloud-simulation provider, offering an integrated solution that combines simulation software with customizable hardware infrastructure for companies to perform scientific and engineering simulations. Rescale serves both large enterprises and small-to-medium-sized businesses in a diverse range of industries, including aerospace, automotive, life sciences and energy.

Ease of use

Accessing Simcenter solutions on Rescale is straightforward and intuitive. You have to simply log in to the Rescale platform using a standard web browser, select the desired hardware configuration, Simcenter software and licensing options. Once your desktop is set up, you can use Simcenter software just as you would on your own desktop. Full online documentation is available, including tutorials to help you get up to speed quickly if you are a new Simcenter user.

Bring-your-own software licensing

All Simcenter software products listed above are available on the Rescale platform for existing Simcenter customers through a bring-your-own-license (BYOL) model. You must purchase a license from Siemens Digital Industries Software as you would for a traditional software license, and then use that license in conjunction with the Simcenter tools that are deployed on the Rescale platform. This lets you leverage your existing investments in Simcenter solutions and then gain immediate access to Rescale's high performance computing infrastructure. In addition, Rescale charges for hardware usage on a price per-core, per-hour basis.

On-demand high-performance computing

Performance is what makes Simcenter the solution of choice for users who need to solve today's increasingly large and complex problems. Siemens has heavily invested in solver performance. For example, Simcenter Nastran can be used to solve large-scale dynamics problems that can be divided into several pieces and sent to multiple processors. With just four central processing units (CPUs), the solution required almost 400 minutes, just over 6.5 hours. But spreading the solution out over 512 CPUs reduced the solution time to just 38.5 minutes – more than 10 times faster.

Simcenter solvers on the Rescale platform give you on-demand hardware scalability to fulfill short-term needs, such as an investigation into an urgent warranty issue. The Rescale cloud infrastructure has already been configured and optimized to take full advantage of each solver's performance, which means you don't need to invest in an information technology (IT) infrastructure to support the use of Simcenter solvers on a high-performance computing (HPC) cluster.

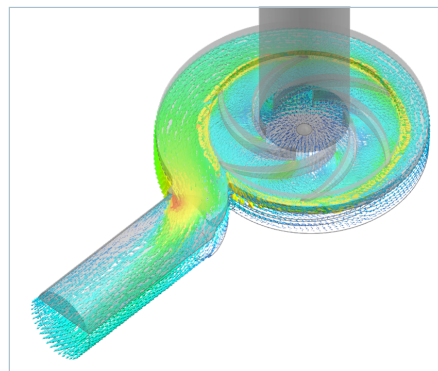
To support these different needs, Rescale has tiered levels of hardware, including high-end machines with large memory and disk space. At the high end of the spectrum, customers can access over 10,000 cores that enable even the largest of models to be solved efficiently. The Rescale file transfer system can also be used to efficiently upload or download files larger than 100 gigabytes (GB), and has been tested on files as large as 2 terabytes (TB).

Platform security

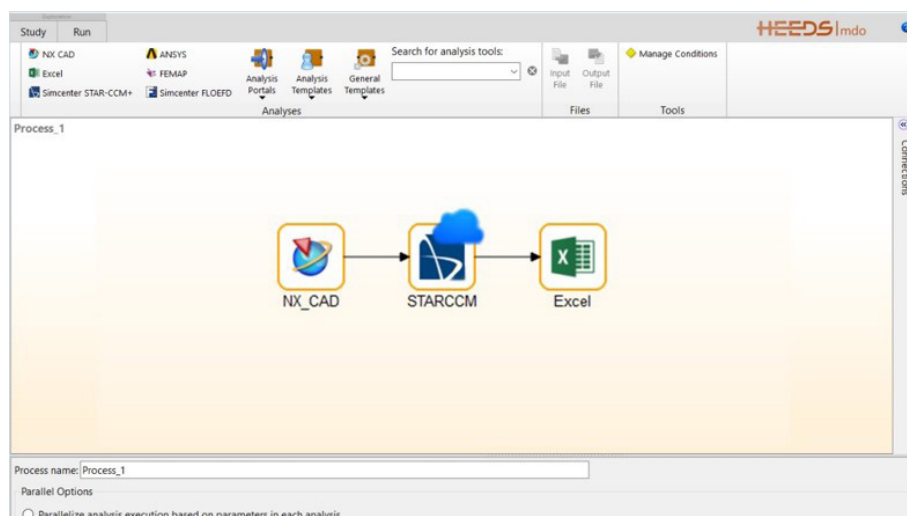
Maintaining data security is an important consideration for every company that is contemplating investing in a cloud-based solution. Rescale has built proprietary, best-in-class security features into its platform. Customer data is encrypted end-to-end and jobs are run on private, closed clusters. IT administrators can manage access and security controls at every level of the organization. In addition, Rescale is compliant end-to-end with the International Traffic in Arms Regulations (ITAR) and Service Organization Controls (SOC 2) compliance requirements.

Design space exploration

To take advantage of the elastic computing capability that the Rescale cloud platform provides, HEEDS easily interfaces with the commercial CAE tools available on Rescale, allowing for scalable computation of design space exploration studies (prescribed designs, Design of Experiments (DOE), Reliability Assessment, Optimization). With its direct interface to Rescale, its hardware queues and software configurations, HEEDS allows for easy parallelization of individual analyses and of design space



Simulate fluid flow with Simcenter 3D

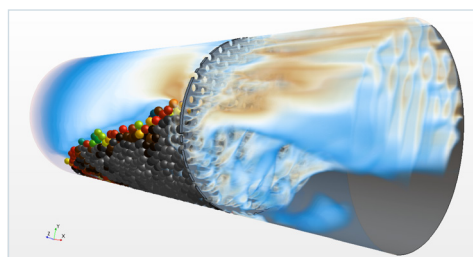
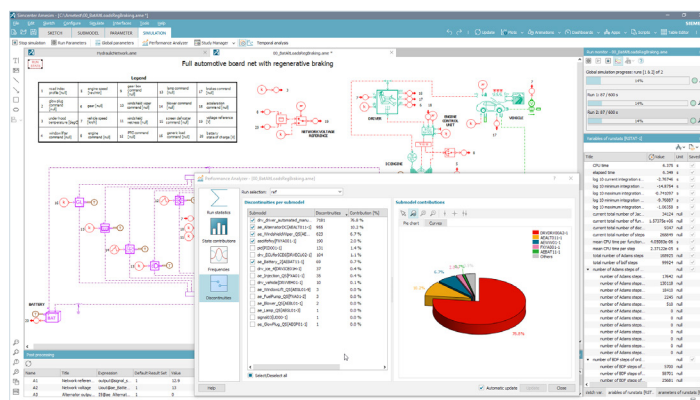


HEEDS easily interfaces with the commercial CAE tools available on Rescale, allowing for scalable computation of design space exploration studies

Moreover, HEEDS itself can be hosted on an on-premise resource, allowing for heterogeneous workflows with some tools running on on-premise hardware, while others running on the Rescale platform (as shown below). Rescale, combined with HEEDS offers the perfect solution for discovering better designs, faster!

Siemens Digital Industries Software and Rescale have partnered to help you get started using Simcenter Rescale with a no-risk free trial. Simply go to the Siemens page on the Rescale website (<https://www.rescale.com/siemens/>) to create an account and learn more about Simcenter solutions on the Rescale platform. With Rescale, you get:

- 100GB free storage and data transfer per month
- Up to 240GB of random access memory (RAM) per node and solid state drive (SSD) storage
- Secure, encrypted data transfer and storage
- No queue – instant HPC clusters on-demand



Run multi-physics simulation involving solid particle transfer using Simcenter STAR-CCM+

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